

## REALITY'S CHOICES

### Air Highspeed

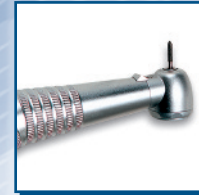
1. **GENTLEforce LUX 6000 B**  
KaVo
2. **Mira Lux 3 635B**  
KaVo
3. **Super-Torque Lux 3 647B**  
KaVo
4. **Midwest Stylus**  
Dentsply Professional
5. **SF 8502**  
MTC
6. **Midwest XGT**  
Dentsply Professional
7. **Midwest Quiet-Air L**  
Dentsply Professional

### Slowspeed

- 1a. **INTRAFlex Lux 2**  
KaVo
- 1b. **K1**  
KaVo
2. **Midwest Rhino XP**  
Dentsply Professional
3. **Midwest Shorty**  
Dentsply Professional

### Electric Highspeed/Slowspeed

1. **ELECTROtorque plus/GENTLEpower LUX**  
KaVo
2. **SiroTorque L**  
Sirona
3. **Midwest eStylus**  
Dentsply Professional



## Air

Highspeed	Cost		Noise (dBA)	Torque (watts)	Weight (incl. coupler)	Handpiece Dimensions (mm)		Head Size (mm)		Head Angle	Maximum Operating Speed (rpm)	Light Intensity (Lux)	Water Spray	Turbine Durability (Sterilization Cycles)
	Handpiece	Coupler				Diameter	Length	Diameter	Length					
<b>GENTLEforce LUX 6000 B</b> KaVo	\$1,200.00	\$295.00	68.1	18	3.6oz/102.6g	16.7	130.0	12.5	13.8	118°	380,000	36,766	4-port	1,000+
<b>Mira Lux 3 635B</b> KaVo	\$995.00	\$295.00	76.5	13	3.4oz/92.6g	16.5	127.0	11.1	12.4	114°	435,000	36,000	1-port	1,000+
<b>Super-Torque Lux 3 647B</b> KaVo	\$945.00	\$295.00	68.2	15	3.5oz/99.2g	16.5	130.0	12.4	14.6	114°	370,000	32,666	3-port	1,000+
<b>Midwest Stylus</b> Dentsply Professional	\$1,085.65	\$288.30	71.0–73.8	>15	3.5oz/98.0g	20.7	125.0	11.0	13.2	108°	400,000	25,233–29,966	4-port	Not specified
<b>SF 8502</b> MTC	\$935.00	\$220.00	71.6	>15	1.2oz/34.0g	15.4	123.0	11.6	14.5	105°	400,000	26,833	5-port	800+
<b>Midwest XGT</b> Dentsply Professional	\$1,010.85	\$288.30	75.9	10–12	3.1oz/88.3g	19.8	118.0	10.6	13.5	108°	400,000	28,800	1-port	1000+
<b>Midwest Quiet-Air L</b> Dentsply Professional	\$866.65	\$1,138.91	73.4	13	2.5oz/69.9g	15.3	123.0	10.7	17.3	109°	400,000	43,833	1-port	1000+

Slowspeed	Cost (motor, contra-angle sheath, head)	Noise (dBA)	Weight (motor, contra-angle sheath, head)	Handpiece Dimensions (mm)		Head Size (mm)		Maximum Operating Speed (rpm)	Light Intensity (Lux)	Water Spray
				Diameter	Length	Diameter	Length			
<b>INTRAFlex LUX 2</b> KaVo	\$1,270.00–\$1,595.00	65.6	4.4oz/125.0g	16.6	178.0	8.5–10.4	10.5–16.2	140,000	28,533	3-port for 1 attachment, 2-port for others
<b>K1</b> KaVo	\$1,055.00–\$1,275.00	64.2–64.8	4.1oz/116.2g–5.2oz/147.4g	18.8	167.0	7.3–9.5	10.8–14.0	20,000	N/A	N/A
<b>Midwest Rhino XP</b> Dentsply Professional	\$1,263.50	67.4	4.0oz/113.4g	18.3	178.0	7.4–9.6	13.4–14.6	8,000	N/A	N/A
<b>Midwest Shorty</b> Dentsply Professional	\$1,370.65–\$1,445.65	73.4–78.2	4.4oz/124.7g–4.9oz/138.9g	18.9	193.0	7.4–9.6	13.4–14.6	30,000	N/A	N/A

## Electric

HighSpeed/ Slowspeed	Cost (motor, control box, attachment, head)	Noise (dBA)	Weight	Handpiece Dimensions (mm)		Head Size (mm)		Head Angle	Maximum Operating Speed (rpm)	Light Intensity (Lux)	Water Spray
				Diameter	Length	Diameter	Length				
<b>ELECTROtorque plus/ GENTLEpower LUX</b> KaVo	\$3,720.00–\$4,445.00	64.7	7.3oz/207.0g	22.1	200.0	9.5–10.4	14.0–15.2	107°–116°	200,000	23,200	3-port for 1 attachment, 2-port for others
<b>SiroTorque L</b> Sirona	\$3,074.00–\$3,498.00	71.8	6.6oz/187.1g	22.1	171.0	8.3–9.7	9.1–15.4	106°	200,000	29,533	3-port
<b>Midwest eStylus</b> Dentsply Professional	\$3,520.00–\$3,753.33	65.1	7.9oz/224.0g	21.2	202.0	9.7–10.2	15.2–15.4	111°	200,000	23,100	4-port

The handpiece remains the preeminent cavity preparation instrument. Even though alternative preparation concepts such as air abrasion and hard tissue lasers have their advocates, it is difficult to imagine that either of these technologies will replace your trusty handpiece in the near future.

## Air vs. Electric

Compressed air remains the most common source of power for these instruments. However, the continued evolution of electric-powered units gives more credence to the fact that these products will be fixtures in treatment rooms for many years.

### Electric (compared to air)

#### ADVANTAGES

- + More torque
- + Better control
- + Quieter

#### DISADVANTAGES

- Larger
- Heavier
- More expensive

## Brush-type vs. Brushless Motors

Traditional electric motors use brushes to help transform electric energy into mechanical power. However, the brushes will eventually wear out and need to be replaced. In a brushless motor, the electrical switching function performed in part by brushes is accomplished electronically.

Brushless motors are presumably more efficient, require minimal or no maintenance, have no decrease in performance, and are quieter than the brush variety. Although brushless motors are typically more expensive than brush-type, their applications at highspeeds (>30,000rpm) are considered superior than brush-type, since the wear on brushes also increases as the speed increases.

## Various Items to Consider When Purchasing a Handpiece

**Light** Most highspeed handpieces are available in fiber optic models, but only a few slowspeed incorporate this vision aid. Having a light from the handpiece adding to our illumination is usually a tremendous vision aid, but they can also cast shadows or be blocked entirely by the type of instrument you are using. The intensity of these lights typically increases when the handpieces are activated. However, fiber optics within the handpieces can degrade over time with repeated autoclaving.

We measured the luminance of all the products with the handpiece directly on our luminance sensor. However, the illumination you achieve in the mouth will typically be lower, since the handpiece is rarely if ever actually directly on the tooth.

### NOTE

Most handpieces now attach to air lines via couplers (allowing the handpiece to snap on and off easily) that house mini-light bulbs. This design eliminates having the light source at the base of the chair and having the light transmitted to the handpiece through fiber optic bundles in the tubing, which can degrade over time. However, there is still an electrical connection through the handpiece tubing. If the voltage is not optimal at the coupler connection to the tubing as recommended by the handpiece manufacturer, then the amount of light being produced will also be compromised, even though you may have just changed the light bulb. We recommend having your service provider check the line voltage to optimize the illumination from your handpiece.

**Water Spray** The number and position of the water outlets contribute to the cooling capability of the handpiece, lubrication of the tooth structure, and cutting effectiveness through keeping the diamond or carbide bur as free from grinding debris as possible. While having water ports around the bur provides the best water spray, those sprays from ports below the bur can also work.

**Push-Button Chuck** Pushing a button on the back of the head of the handpiece is the easiest way to insert and remove a bur. Unless indicated, all the handpieces we evaluated have this type of chuck.

**Durability** With routine autoclaving, all handpieces are being tested for their ability to withstand repeated cycles. We have listed for the highspeeds the number of autoclave cycles for which the handpieces are rated.

**Noise** Just the sound of a handpiece is enough to strike fear in many patients. And noisy handpieces are not good for your hearing either. We measured the noise produced by all the products with the handpiece directly on our audible sensor. However, the noise you and your patients are subjected to will typically be lower, since the handpiece would never be directly over your or the patient's ear. Furthermore, regardless of the decibel rating, some handpieces just sound more shrill than others.

**Torque** Just like horsepower for a car, which comes in handy when you really need it, more torque usually allows us to cut with more precision. All of the highspeeds tested have excellent torque and could not be stalled out when preparing extracted teeth.

**Weight** Usually, lighter is better.

**Balance** This is how the handpiece “feels” in your hand.



**Size of Head** Smaller heads can obviously access more areas in mouths of patients with restricted opening. But smaller heads usually have less power than their full-size brethren.

**Coupler** Allows easy and fast connection to air lines. All of the highsPEEDs and some of the slowsPEEDs use this time-saving system, where you merely snap-on and snap-off a handpiece as needed.

**Maintenance** HighsPEEDs tend to be easier to maintain than lowsPEEDs, which usually require separate and sometimes labor-intensive steps. However, due to routine sterilization procedures after each use, replacing turbines has become a necessary nuisance. While this can be done in the office with special equipment, most handpiece manufacturers still insist on “factory-replacement” parts and labor. This is typically more expensive than the “do-it yourself” route, but may save you from ruining a perfectly good handpiece and could keep you from voiding your warranty.

### NOTE

With all types of handpieces being subjected to repeated sterilization cycles, their durability is critical. Anything that a clinician can do to stave off the seemingly inevitable repairs and/or turbine replacements should be seriously considered. One approach is equipment-based, utilizing an automatic lubrication/purging device such as the QuattroCare. While this type of equipment is very effective, it does require significant counter space and its entry level cost is significant.

Another approach is advocated by Sirona, the manufacturer of one of the electric handpieces in this section. By the simple act of storing handpieces vertically head down (instead of merely storing them in a drawer horizontally), you can prevent the lubricant from draining out of this all-important section and ensure it will be well-lubricated when it is used. And you don't need to purchase a dedicated and expensive “handpiece rack” for storing the handpieces. Any container with sidewalls high enough to keep the handpieces vertical in the sterilization bags will be more than adequate.

Inexpensive solutions like this can pay substantial dividends in lower maintenance costs, less downtime, and better performance. Sirona should be congratulated for promoting helpful procedures such as this one.

**Contamination** Oil from handpieces has been implicated in contaminating your preparation and interfering with adhesion. To test this possibility, we exposed dentin specimens to five minutes of handpiece spray to simulate a crown preparation. The handpiece was run first to expel visible lubricant, just as you should do before using a freshly lubricated and autoclaved handpiece. No cleaning procedures were performed, since we did not want to introduce another variable. These specimens were then tested for bond strength. The results in MPa were:

Control	32.7
Contaminated	30.1

This test suggests that contamination from handpiece lubricant is a real possibility. Even though bond strengths only dropped slightly, these tests are run on flat teeth that, even though no specific cleaning procedures were done, could be scrutinized very closely for contamination. Clinically, we strongly suggest routine use of a cavity cleaner to remove any residual lubricant. In addition, don't use a handpiece if it continues to spray lubricant on teeth you are about to restore.

Handpieces that do not require routine lubrication eliminate this source of contamination and save time. However, their long-term durability may suffer.

## Air – Highspeed

## GENTLEforce LUX 6000 B



1

KaVo  
(4.8)

www.kavousa.com

**Cost:**

\$1,200.00 Handpiece

\$295.00 Coupler

**Warranty:**

- 1 year on all parts including turbine  
OR
- 18 months on all parts maintained with the KaVo QUATTROcare automatic maintenance unit
- 5 years for fiber optics

**What if it needs repairs?** Contact KaVo Technical Service.**Is there a loaner program?** No.**RAVES & RANTS**

- + Smooth skin makes cleaning a breeze
- + Smaller head and streamlined body improve access

- Most expensive
- Not a quantum leap over 647

**Description**

High torque, full size.

**Light Intensity (Lux)**

36,766

**Water Spray**

4-port, arranged around the bur.

**Durability (Turbine)**

Exceeds 1,000 sterilization cycles.

**Noise (dBA)**

68.1

**Torque**

18 watts.

**Maximum Operating Speed**

380,000 rpm.

**Weight (including coupler)**

3.6oz/102.6g

**Balance**

Excellent.

**Handpiece Dimensions**

Diameter 16.7mm  
Length 130.0mm

**Head Dimensions**

Diameter 12.5mm  
Length 13.8mm

**Angle of the Head**

118°

**Maintenance**

Clean surface of handpiece after use. Insert nozzle of KaVo spray in the back of the handpiece and lubricate with KaVo spray for one second. Run the handpiece for 20 seconds and wipe excess lubricant off outside of handpiece. Autoclave or chemiclave. This procedure should be done after each use. ➤

2



## Mira Lux 3 635

KaVo  
(4.7) [www.kavousa.com](http://www.kavousa.com)

**Cost:**

\$995.00 Handpiece

\$295.00 Coupler

**Warranty:**

- 1 year
- 5 years for fiber optics

**What if it needs repairs?** Contact KaVo Technical Service.**Is there a loaner program?** No.**RAVES & RANTS**

- + Best mini head on the market
- + High torque makes you forget it's small
- Terrific engineering comes at a high price
- Relatively noisy

**Description**

High torque, miniature head.

**Light Intensity (Lux)**

36,000

**Water Spray**

1-port, below the bur.

**Durability (Turbine)**

Exceeds 1,000 sterilization cycles.

**Noise (dBA)**

76.5

**Torque**

13 watts.

**Maximum Operating Speed**

435,000 rpm.

**Weight (including coupler)**

3.4oz/96.2g

**Balance**

Excellent.

**Handpiece Dimensions****Diameter** 16.5mm**Length** 127.0mm**Head Dimensions****Diameter** 11.1mm**Length** 12.4mm**Angle of the Head**

114°

**Maintenance**

Clean surface of handpiece after use. Insert nozzle of KaVo spray in the back of the handpiece and lubricate with KaVo spray for one second. Run the handpiece for 20 seconds and wipe excess lubricant off outside of handpiece. Autoclave. ➤

## Super-Torque Lux 3 647B

KaVo  
www.kavousa.com (4.5)

3

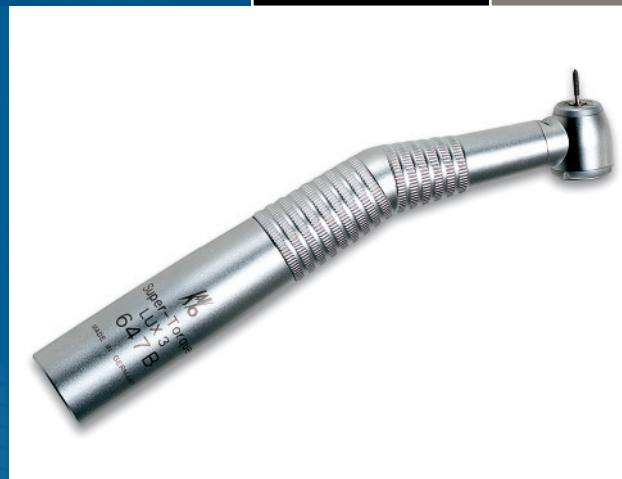
**Cost:**

\$945.00 Handpiece

\$295.00 Coupler

**Warranty:**

- 1 year
- 5 years for fiber optics

**What if it needs repairs?** Contact KaVo Technical Service.**Is there a loaner program?** No.**RAVES & RANTS**

- + Still a workhorse
- + Amazingly quiet and powerful
- Ribbed cladding looks outdated
- Fairly large head

**Description**

High torque, full size.

**Light Intensity (Lux)**

32,666

**Water Spray**

3-port, arranged around the bur.

**Durability (Turbine)**

Exceeds 1,000 sterilization cycles.

**Noise (dBA)**

68.2

**Torque**

15 watts.

**Maximum Operating Speed**

370,000 rpm.

**Weight (including coupler)**

3.5oz/99.2g

**Balance**

Excellent.

**Handpiece Dimensions****Diameter** 16.5mm**Length** 130.0mm**Head Dimensions****Diameter** 12.4mm**Length** 14.6mm**Angle of the Head**

114°

**Maintenance**

Clean surface of handpiece after use. Insert nozzle of KaVo spray in the back of the handpiece and lubricate with KaVo spray for one second. Run the handpiece for 20 seconds and wipe excess lubricant off outside of handpiece. Autoclave. ➤

4

## Midwest Stylus

Dentsply Professional  
www.professional.dentsply.com★★★★★  
(4.0)**Cost:**

\$1,085.65 Handpiece

\$288.30 Coupler

**Warranty:**

- 1 year with EasyCare (no lubrication) option
- 1.5 years without EasyCare
- 5 years for fiber optics

**What if it needs repairs?** Contact Midwest Air Repair at 800-800-7202. Turnaround is reported to be two days.

**Is there a loaner program?** No.

**RAVES & RANTS**

- + Choice of lube or no-lube option
- + Smallest head of full-size models
- Noisy with EasyCare
- Lowest light output with EasyCare

**Maximum Operating Speed**

400,000 rpm.

**Weight (including coupler)**

3.5oz/98.0g

**Balance**

Very good.

**Handpiece Dimensions**

**Diameter** 20.7mm  
**Length** 125.0mm

**Head Dimensions**

**Diameter** 11.0mm  
**Length** 13.2mm

**Angle of the Head**

108°

**Maintenance**

With EasyCare, you merely clean the handpiece after use and autoclave. The chuck, however, still needs to be lubricated once a week. Note that if you forget that this handpiece does not require lubrication and accidentally lubricate it after use, then the no-lube feature is negated and you will need to continue to lubricate the handpiece for the rest of its useful life. With the conventional lubrication model, spray cleaner/lubricant in back of handpiece for one second. Run for 20 seconds to expel oil. Bag and autoclave. ➤

**Description**

High torque, full size handpiece.

**Light Intensity (Lux)**

**With EasyCare** 25,233  
**Without EasyCare** 29,966

**Water Spray**

4-port, arranged around the bur.

**Durability (Turbine)**

No specified other than stating it will last for the warranty period.

**Noise (dBA)**

**With EasyCare** 73.8  
**Without EasyCare** 71.0

**Torque**

&gt;15 watts.





(3.9)

SF 8502

MTC

www.mtcamerica.com

5

**Cost:**

\$935.00 Handpiece

\$220.00 Coupler

**Warranty:** 1 year**What if it needs repairs?** Return to MTC.**Is there a loaner program?** Yes.**RAVES & RANTS**

- + Lube-free
- + Five-port spray
- Not as much light as others
- No longer the low price leader

**WHAT'S NEW?**

- Easier push-button chuck
- Less noise
- Less vibration
- Better concentricity
- More torque

**Description**

High torque, full size handpieces, lubrication-free.

**Light Intensity (Lux)**

26,833

**Water Spray**

5-port, arranged around the bur.

**Durability (Turbine)**

&gt;800 sterilization cycles. (Manufacturer has not tested it beyond this point.)

**Noise (dBA)**

71.6

**Torque**

&gt;15 watts.

**Maximum Operating Speed**

400,000 rpm.

**Weight (including coupler)**

1.6oz/46.4g

**Balance**

Very good.

**Handpiece Dimensions****Diameter** 15.4mm**Length** 123.0mm**Head Dimensions****Diameter** 11.6mm**Length** 14.5mm**Angle of the Head**

105°

**Maintenance**

Wipe handpiece externally, bag and autoclave. Does not require lubrication. ➤

6

ENCORE

# Midwest XGT

Dentsply Professional

★★★★★  
(3.6)

## RAVES & RANTS

- + Shortest length
- + It doesn't look like others
- Noisy
- Ergonomic shape feels weird

### Cost:

\$1,010.85 Handpiece

\$288.30 Coupler

**Warranty:** 1 year

**What if it needs repairs?** Contact Midwest Air Repair at 800-800-7202. Turnaround is reported to be two days.

**Is there a loaner program?** No.

### Description

High torque, full size handpiece.

### Light Intensity (Lux)

28,800

### Water Spray

1-port, below the bur.

### Durability (Turbine)

>1000 sterilization cycles. (Manufacturer has not tested it beyond this point.)

### Noise (dBA)

75.9

### Torque

10–12 watts.

### Maximum Operating Speed

400,000 rpm.

### Weight (including coupler)

3.1oz/88.3g

### Balance

Very good.

### Handpiece Dimensions

Diameter 19.8mm

Length 118.0mm

### Head Dimensions

Diameter 10.6mm

Length 13.5mm

### Angle of the Head

108°

### Maintenance

Spray cleaner/lubricant in back of handpiece for one second. Run for 20 seconds to expel oil. Bag and autoclave. ➤



(3.5)

# Midwest Quiet-Air L

Dentsply Professional

7





NEW

**Cost:**

\$866.65 Handpiece

\$1,138.91 Fiber optic box and tubing

**Warranty:** 6 months on both handpiece and turbine**What if it needs repairs?** Contact Midwest Air Repair at 800-800-7202. Turnaround is reported to be two days.**Is there a loaner program?** No.**RAVES & RANTS**

-  The handpiece of our youth
-  Most powerful fiber optic light
-  Power lever chuck not as user-friendly as push button
-  Fiber optic hoses degrade over time

**Description**

High torque, full size handpiece. Has Power Lever chuck.

**Light Intensity (Lux)**

43,833

**Water Spray**

1-port, below the bur.

**Durability (Turbine)**

&gt;1000 sterilization cycles. (Manufacturer has not tested it beyond this point.)

**Noise (dBA)**

73.4

**Torque**

13 watts.

**Maximum Operating Speed**

400,000 rpm.

**Weight**

2.5oz/69.9g

**Balance**

Very good.

**Handpiece Dimensions****Diameter** 15.3mm**Length** 123.0mm**Head Dimensions****Diameter** 10.7mm**Length** 17.3mm**Angle of the Head**

109°

**Maintenance**

Spray cleaner/lubricant in back of handpiece for one second. Run for 20 seconds to expel oil. Bag and autoclave. ➤

1a



## INTRAflex Lux 2

 KaVo  
 (4.5) www.kavousa.com


## Cost:

\$1,460.00 Contra-angle w/integrated motor and head  
 \$1,070.00–\$1,180.00 Diff. contra-angles w/integrated motors  
 \$850.00 Straight w/integrated motor  
 \$200.00–\$415.00 Various heads

**Warranty:** 1 year

**What if it needs repairs?** Contact KaVo Technical Service.

**Is there a loaner program?** No.

## RAVES &amp; RANTS

- + Terrific light
- + Only slowspeed that can emulate a highspeed
- Expensive
- Can there be too many options?

## Heads available

6 (plus three endo and one Profin head, which we did not receive for evaluation)

68LH	1:1 latch.
80LD	1:1 friction grip.
67LH	2:1 reduction latch.
62LDN	10:1 reduction latch head.
31LR	2:1 reduction for screw-in or snap-on cups.
52LDN	1:1 miniature latch.

## Weight

2325LN	4.4oz/125.0g
All others (engines w/68LH head)	4.4oz/125.0g

## Handpiece Dimensions (2325LN)

Diameter	16.6mm
Length	178.0mm

## Head Dimensions

2325LN	
Diameter	9.5mm
Length	16.2mm
68LH	
Diameter	9.7mm
Length	14.0mm
80LD	
Diameter	10.4mm
Length	14.8mm
67LH	
Diameter	9.5mm
Length	14.0mm
62LDN	
Diameter	9.0mm
Length	13.2mm
31LR	
Diameter	8.5mm
Length	16.0mm
61LF	
Diameter	8.5mm
Length	10.5mm

## Description

Slowspeed system with integrated motors, fiber optics, and water spray. One instrument has the head fused to the sheath, but all the remaining options allow you to mix and match the engine/sheath with the heads quickly and easily.

## Light Intensity (Lux)

2325LN	28,533
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## Water Spray

2325LN	3-port, arranged around the bur.
Others	2-port, below the bur. (1 port is water, the other is air—it mixes externally to a fine spray mist.)

## Noise (dBA)

2325LN	65.6
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## Maximum Operating Speed (rpm)

2325LN	140,000
2320LN	35,000
2307LN	13,000
2329LN	5,000
2313LN	12,000 (Straight)



52LDN  
 Diameter 9.0mm  
 Length 12.2mm

**Maintenance**

Clean, remove head, spray the head and shank with KaVo spray lubricant for one second, autoclave. ➤

**K1**  
KaVo  
www.kavousa.com (4.5)

★★★★★  
**REALITY'S CHOICES**


1b

**Cost:**  
**\$570.00** Air motor  
**\$295.00–\$400.00** Contra-angle attachments  
**\$385.00–\$525.00** Straight attachments  
**\$190.00–\$305.00** Various heads

**Warranty:** 1 year

**What if it needs repairs?** Contact KaVo Technical Service.

**Is there a loaner program?** No.



**RAVES & RANTS**

- + Basic workhorse
- + Strong, durable motor
- No light
- Option to fit KaVo coupler would be nice

**Description**

Basic slowspeed system with separate motor, contra-angle and straight attachments, and heads.

**Light Intensity (Lux)**

Not offered.

**Water Spray**

Not offered.

**Noise (dBA)**

64.2–64.8 depending on the attachment.

**Maximum Operating Speed (rpm)**

20K	20,000
29K	2,700
10K	20,000 (Straight)

**Weight**

Motor/shaft/head	4.4oz/124.7g
Straight for trimming	4.1oz/116.2g
Straight for prophylaxis	5.2oz/147.4g

**Handpiece Dimensions**

Diameter	18.8mm
Length	167.0mm

**Function and Head Dimensions**

All push-button heads from the INTRAmatic and INTRAflex Lux 2 will also fit the K1 system, but these heads are not recessed in the K1 as they are in the INTRAflex. When the push-button heads are mounted on a K1 attachment, they extend out, lengthening the handpiece somewhat and creating a longneck, slightly strange appearance. Functionally, however, they perform as well as the non-push-button heads.

**68G 1:1 Latch (not push-button)**

Diameter	7.5mm
Length	14.0mm

**80G 1:1 FG**

Diameter	8.9mm
Length	13.6mm

**67G 2:1 Latch (not push-button)**

Diameter	7.3mm
Length	14.0mm

**31GR 2:1 for prophylaxis (snap-on or screw-in)**

Diameter	7.4mm
Length	10.8mm

**62GN 10:1 Reduction**

Diameter	9.5mm
Length	13.6mm

**Maintenance**

Clean, remove head, spray motor, head, and shaft with lubricant for one second, autoclave. ➤

2

## Midwest Rhino XP

Dentsply Professional



(3.7)

## RAVES &amp; RANTS

- Good torque
- Much better balance than Shorty
- Doesn't seem to fit name
- No dual-speed option

## Cost:

\$846.60 Air Motor

\$182.20 Contra-angle attachment

\$234.70 Head

Warranty: 1 year

**What if it needs repairs?** Contact Midwest Air Repair at 800-800-7202. Turnaround is reported to be two days.

**Is there a loaner program?** May be available through local representative.

## Description

Slowspeed motor designed to work with all the contra-angle, straight attachments, and heads of the Shorty.

## Light Intensity (Lux)

Not offered.

## Water Spray

Not offered.

## Noise (dBA)

67.4

## Maximum Operating Speed (rpm)

8,000.

## Weight

Motor, contra-angle, and latch-type head 4.0oz/113.4g

## Handpiece Dimensions

Diameter 18.3mm

Length 178.0mm

## Function and Head Dimensions

See Shorty.

## Maintenance

Clean, place three drops of lubricant into drive air tube and run until it reaches normal speed, autoclave. ➤



(3.5)

## Midwest Shorty

Dentsply Professional

3

**Cost:****Motor only:**

\$1,028.75 Two-Speed

\$953.75 Single Speed

\$182.20 Contra-angle attachment

\$234.70 Head

**Warranty:** 1 year

**What if it needs repairs?** Contact Midwest Air Repair at 800-800-7202. Turnaround is reported to be two days.

**Is there a loaner program?** May be available through local representative.

**RAVES & RANTS**

- THE classic slowspeed
- Durability proven
- Noisiest slowspeed
- Backend heavy

**Description**

Basic slowspeed system with separate motor (single or two-speed), contra-angle and straight attachments, and heads.

**Light Intensity (Lux)**

Not offered.

**Water Spray**

Not offered.

**Noise (dBA)**

Single speed 73.4

Two-speed 78.2

**Maximum Operating Speed (rpm)**

Single speed 6,000

Two-speed 30,000

**Weight**

Motor/contra-angle shaft/latch head 4.4oz/124.7g

Motor/Straight 4.9oz/138.9g

**Handpiece Dimensions**

Diameter 18.9mm

Length 193.0mm

**Function and Size of Heads****Latch**

Diameter 9.6mm

Length 14.3mm

**FG**

Diameter 9.6mm

Length 14.6mm

**Prophy (screw-in)**

Diameter 7.4mm

Length 13.4mm

**Maintenance**

**Motor** More labor-intensive than other handpieces. Three drops of lubricant go into the drive air tube after each use. Then, on an “as-needed” basis or once-a-week, one drop goes into four other areas of the engine. Autoclave after each use.

**Straight Attachment** First you have to use their handpiece cleaner by spraying it into both ends and on the exterior. Then rinse, run with a bur, and dry. Then lubricate with three drops in back-end and one drop into chuck. Run again and then autoclave.

**Contra-Angle Sheath and Heads** Clean by spraying with handpiece cleaner into chuck, backend of angle, and exterior surface. Then rinse, run, and dry. Lubricate with three drops into backend of angle. Run, bag, and autoclave. ➤

1

★★★★★  
**REALITY'S  
CHOICES**

## ELECTORtorque plus/Gentlepower LUX

KaVo

(4.9) [www.kavousa.com](http://www.kavousa.com)**Cost:** \$2,905.00 (does not include handpieces)**Includes:**

- ELECTORtorque plus module w/cable
- ELECTORtorque plus transformer w/connector
- Electric tubing
- 701 brushless electric motor
- Mounting bracket w/hardware

**Handpieces:**

\$615.00-\$845.00 Slowspeed attachments

\$1,540.00 Highspeed attachment

\$895.00 Straight (FO) attachment

\$675.00 Straight (non-FO) attachment

\$200.00-\$415.00 Various heads

**Warranty:** 3 years for the motor and controls  
1 year for handpieces**What if it needs repairs?** Contact KaVo Technical Service.**Is there a loaner program?** No.

### RAVES & RANTS

- + Brushless motor a joy
- + Quietest
- Handpiece and motor “skins” don’t match
- Most expensive—by far

### WHAT'S NEW?

Shorter motor

### Description

Second version of electric handpiece system with brushless motor. Speed can vary from 27 to 200,000rpm, depending on the attachment and setting.

### Control Box

Taupe plastic rectangular box, measuring 9.4in/24.0cm long (including room for cords), 4.9in/12.5cm wide, and 2.1in/5.3cm high. Not unattractive, but not particularly high tech either. Connects to your unit and features a digital LED readout that displays your speed in 1000rpm increments. For example, if the display reads “40”, that means you are cutting at 40,000rpm. This speed is controlled by soft touch “up” and “down” arrows directly to the right of the display. On the left of the display is another soft touch button, which gives you forward and reverse functions.

There are also two programmable, soft touch buttons (S1 & S2) that are located directly below the LED readout. You can program these buttons for your two most used speeds.

### Electric Motor

Similar to an air motor of a slowspeed handpiece. It is the only handpiece in this section that has brushless technology. The new model (701) is shorter than the previous version. At the base of the motor, where it connects to the electric cord, is a circular knob with serrations for easier rotation. This knob controls the water flow right at the handpiece, rather than having to go back to the unit for this function. The swivel that used to be at the junction of the handpiece and motor is now between the motor and the tubing.

### Light Intensity (Lux) w/25LPA

Voltage	Lux
3.0v	17,386
3.2v	23,200
3.8v	43,600

### Water Spray

25LPA	3-port, arranged around the bur.
Others	2-port, below the bur.

### Noise (dBA)

64.7 w/25LPA



**Maximum Operating Speed (rpm)**

25LPA	200,000
10LP	40,000
7LP	14,814

**Maximum Operating Speed (rpm), Gear Ratio, and Chuck**

Handpiece	Max. Speed	Gear Ratio	Chuck
25LPA	200,000	1:5	FG
20LP	40,000	1:1	Depends on head
7LP	14,814	2.7:1	Depends on head
10CH (straight)	40,000	1:1	HP

**Heads available**

7 (plus two endo heads, which we did not receive for evaluation)

68LH	1:1 latch.
80LD	1:1 friction grip.
67LH	2:1 reduction latch.
62LDN	10:1 reduction latch head.
31LR	2:1 reduction for screw-in or snap-on cups.
61LG	Profin w/water attachment.
61LRG	Profin w/ratcheted rotational wheel for 36 positions.

**Weight (w/ motor)**

25LPA	7.3oz/207.0g
20LP (w/68LH head)	7.3oz/207.0g
7LP (w/68LH head)	7.3oz/207.0g

**Handpiece Dimensions w/25LPA**

Diameter	22.1mm
Length	200.0mm

**Head Dimensions**

25LPA	
Diameter	10.2mm
Length	15.2mm

68LH	
Diameter	9.7mm
Length	14.0mm

80LD	
Diameter	10.4mm
Length	14.8mm

67LH	
Diameter	9.5mm
Length	14.0mm

**Angle of the Head**

25LPA	116°
20LP	107°
7LP	107°

**Maintenance**

Motor does not have to be lubricated. For attachments, clean, remove head, spray the head and shank with KaVo spray lubricant for one second, autoclave. ➤

2

NEW

## SiroTorque L

Sirona

★★★★  
(4.2)

## RAVES &amp; RANTS

- + Smallest and lightest electric
- + Can turn off light at control panel
- No starting point for water adjustment—can't preset
- Avalanche of burned out or defective light bulbs

## Description

Features titanium handpieces that which fit completely over the brush-type electric motor. Speed can vary from 80 to 200,000rpm, depending on the handpiece and setting.

## Control Box

Off-white plastic rectangular box, measuring 9.1in/23.0cm long (including room for cords), 6.1in/15.5cm wide, and 2.8in/7.0cm high. Not unattractive, but not particularly high tech either. Connects to your unit and features a digital LED readout that displays your speed in 1000rpm increments. For example, if the display reads "40", that means you are cutting at 40,000rpm (assuming you are using a 1:1 gear ratio handpiece). This speed is controlled by soft touch "+" and "-" buttons directly below the display. On the immediate left of the speed buttons are two programmable, soft touch buttons (1 & 2). These are set for 5,000rpm and 40,000rpm at the factory, but can be changed by the operator. However, mathematical mental gymnastics are required to determine the ultimate speed of the bur, depending on the ratio of each individual handpiece (e.g. 1:5, 1:1, 6:1, 24:1, etc).

On the far left are two more buttons, one that allows you to operate with or without the fiber optic illumination and one that gives you forward and reverse functions. The illumination button is set in the factory to provide 3.3v, but you can adjust this setting to be as low as 3.0v or as high as 4.0v in 0.1v increments by using the aforementioned "+" and "-" buttons. These adjustments will produce more or less illumination as you prefer. There are also other adjustments such as controlling the sensitivity of the foot pedal.

## Electric Motor

Similar to an air motor, but has no outer skin, since it is totally encased by the handpiece sheath. It has been on the market over 20 years, which means it has a long track record, but it does not feature new brushless motor technology. At the base of the motor, where it connects to the electric cord, is a circular knob with wide

**Cost:** \$1,999.00 (does not include handpieces)

## Includes:

- SL Motor w/cable
- Transformer
- Control box
- Mounting bracket w/hardware

## Handpieces:

**\$1,499.00** Highspeed attachment (S 200 L)

**\$1,075.00–\$1,180.00** Slowspeed attachments

**\$750.00** Propy attachment

**\$645.00** Straight (non-FO) attachment

**\$680.00** Adapter

**Warranty:** 3 years for the motor and controls.

2 years for handpieces, which can be extended to 3 years for \$155.00 or 5 years for \$775.00. These extended warranties include 1 case of TI Spray (3 years) or 5 cases (5 years) to ensure the handpieces have been properly lubricated.

**What if it needs repairs?** Contact Sirona at 800-659-5977. If the problem cannot be handled by phone, you send the handpiece via FedEx using Sirona's account number to its facility. Turnaround is reported to be 24 hours or less.

**Is there a loaner program?** No.

serrations for easier rotation. This knob controls the water flow right at the handpiece, rather than having to go back to the unit for this function.

In the U.S. versions, there is an additional black plastic sleeve that fits rather imprecisely over the backend of the motor. This sleeve is supposed to adapt the handpiece to different brackets, but it interferes with proper asepsis, which seems odd since the entire handpiece (other than the sleeve) is designed to foster, not impede cleanliness. Unfortunately, the only method to remove the sleeve is to cut it off. We suggest ordering the handpiece without the sleeve.

## Light Intensity (Lux) w/ S 200 L

## Unit 1 (Stand-Alone)

Voltage	Lux
3.0v	19,076
3.3v	29,533
4.0v	58,400

## Unit 2 (Wired Through Dental Unit)

Voltage	Lux
3.0v	13,236
3.3v	19,503
4.0v	41,466

**Water Spray**

(not available w/ Endo and Prophy)

**Standard** 3-port, arranged around the bur, but spray ring can be changed to 2-port, above and below the bur or 2-port, both below the bur.

**Profin** 2-port, above and below the bur.

**Straight** 2-port, both below the bur.

**Noise (dBA)**

71.8 w/S 200 L.

**Maximum Operating Speed (rpm), Gear Ratio, and Chuck**

Handpiece	Max. Speed	Gear Ratio	Chuck
<b>S 200 L</b>	200,000	1:5	FG
<b>S 40 L</b>	40,000	1:1	Latch
<b>S 6 L</b>	6,000	6:1	Latch
<b>S 1.6 L</b>	1,600	24:1	Latch
<b>Endo L</b>	4,000	9.5:1	Latch
<b>Prophy</b>	5,000	2.4:1	Snap-on/Screw-in
<b>S H 40 (straight)</b>	40,000	1:1	HP

**Weight (w/ motor)**

<b>S 200 L</b>	6.6oz/187.1g
<b>S 40 L</b>	6.5oz/184.3g
<b>S 6 L</b>	6.3oz/178.6g
<b>S 1.6 L</b>	6.4oz/181.4g
<b>Endo L</b>	6.4oz/181.4g
<b>Prophy</b>	6.3oz/178.6g
<b>S H 40 (straight)</b>	6.9oz/195.6g
<b>Profin 04 L</b>	6.0oz/170.1g
<b>Profin 11 L</b>	6.4oz/181.4g

**Handpiece Dimensions w/ S 200 L**

<b>Diameter</b>	22.1mm
<b>Length</b>	171.0mm

**Head Dimensions**

<b>S 200 L</b>	
<b>Diameter</b>	9.7mm
<b>Length</b>	15.4mm

**S 40 L**

<b>Diameter</b>	9.7mm
<b>Length</b>	14.2mm

**S 6 L**

<b>Diameter</b>	9.7mm
<b>Length</b>	14.2mm

**S 1.6 L**

<b>Diameter</b>	9.7mm
<b>Length</b>	14.2mm

**Endo L**

<b>Diameter</b>	9.7mm
<b>Length</b>	13.7mm

**Prophy**

<b>Diameter</b>	9.7mm
<b>Length</b>	13.7mm

**Profin 04 L**

<b>Diameter</b>	8.3mm
<b>Length</b>	9.1mm

**Profin 11 L**

<b>Diameter</b>	8.3mm
<b>Length</b>	9.3mm

**Angle of the Head**

200L	106°
40L	106°
6L	106°

**Maintenance**

Motor does not have to be lubricated. For handpieces, clean and spray the head and shank with T1 spray lubricant for 1-2 seconds, run to expel excess lubricant, autoclave, store vertically in bags with heads down. ➤

3

## Midwest eStylus

Dentsply Professional  
www.professional.dentsply.com★★★★★  
(4.0)

NEW

**Cost:** \$2,458.18 (does not include handpieces)**Includes:**

- Controller and Remote Display/Control
- Transformer and Power Cord
- Electric Motor
- Mounting bracket

**Handpieces:**

\$1,294.55 Highspeed attachment

\$1,061.82–\$1,127.27 Slowspeed attachments

\$381.82 Straight (non-FO) attachment

**Warranty:** 1 year for the motor, hose, and controller.  
2 years if purchased in a pre-packaged system.

**What if it needs repairs?** Contact Midwest Air Repair at 800-800-7202. Turnaround is reported to be two days.

**Is there a loaner program?** If repair cannot be completed quickly, loaner can be arranged through a Dentsply Professional Sales Representative.

## RAVES &amp; RANTS

- + Detachable control panel
- + Speed displayed without requiring a calculator
- No water adjustment on handpiece
- Brush-type motor not the latest

**Description**

Features a brush-type electric motor and unique control box with a detachable control panel. Speed can vary from 150 to 200,000rpm, depending on the handpiece and setting.

**Control Box**

Off-white plastic rectangular box, measuring 7.9in/20.0cm long (including room for cords), 4.4in/11.2cm wide, and 2.2in/5.5cm high. Has a curvaceous contemporary appearance. But the most unique aspect of this box is that you can detach the control panel if you choose. It detaches by pressing a small positioning extension on the bottom of the control box where the control panel connects.

The control panel has the same width and height dimensions as the entire box, but its length is only 1.8in/4.5cm. Powered by conventional AA batteries, it can be positioned anywhere in the treatment room and communicates with the control box via a RF connection.

The LCD, which is slightly to the left of center position, shows you which handpiece you are using and the bur speed you have selected without needing to perform any mathematical calculations. This speed actually changes as the bur cuts the tooth, letting you see how much the handpiece slows down during use. We're

not exactly sure why you would want this information, but it is a cool feature. This speed is controlled by soft touch “▲” and “▼” buttons directly to the right of the display. Under the speed control buttons are similar ones to adjust the torque when you are in the Endo mode—there are four torque limit settings. To enter the Endo mode, you push the Endo button immediately below the torque buttons.

On the left of the LCD are the Standby and Reverse buttons, the latter of which is accompanied by a small LED that illuminates to alert you that you have activated this mode. The bottom of the panel houses three color-coded buttons that match the color rings on the various handpieces. The middle of these buttons also has the gear ratio as a nice reminder.

The final control is a button to the right of the three color-coded ones. This button allows you to custom program 12 additional gear ratios besides those programmed by the factory. Other features allow you to change how long the fiber optic light will stay on after you stop the handpiece and to adjust the brightness of the light.

**Electric Motor**

The brush-type electric motor is cloaked in a smooth, satin-finished stainless steel with an integral swivel.



**Light Intensity (Lux)**

Amperage	Lux
700mA	17,346
730mA	23,100
760mA	32,466

**Water Spray**

1:5 & 1:1	4-port, arranged around the bur.
10:1	None.

**Noise (dBA)**

65.1 w/1:5

**Maximum Operating Speed (rpm), Gear Ratio, and Chuck**

Handpiece	Max. Speed	Gear Ratio	Chuck
Red	200,000	1:5	FG
Blue	40,000	1:1	Latch
Green	4,000	10:1	Latch
Straight	40,000	1:1	HP

**Weight (w/ motor)**

Red	7.9oz/224.0g
Blue	7.8oz/221.1g
Green	7.8oz/221.1g
Straight	7.1oz/201.3g

**Handpiece Dimensions w/1:5 (Red)**

Diameter	21.2mm
Length	202.0mm

**Head Dimensions****1:5 (Red)**

Diameter	10.2mm
Length	15.4mm

**1:1 (Blue)**

Diameter	9.7mm
Length	15.3mm

**10:1 (Green)**

Diameter	9.7mm
Length	15.2mm

**Angle of the Head**

1:5 (Red)	111°
1:1 (Blue)	111°
10:1 (Green)	111°

**Maintenance**

Motor does not have to be lubricated, but the sheath can actually be pulled off for autoclaving, which is a nice feature. For handpieces, clean with Midwest Plus Cleaner, rinse, dry, spray with Midwest Plus Aerosol spray lubricant for 1-2 seconds, run to expel excess lubricant, autoclave, store vertically in bags with heads down. ➤

# REALITY

## AIR

### HIGHSPEED

The **GENTLEforce LUX 3 6000B** is the flagship of KaVo air-powered handpiece lineup. Except for its name, there is hardly anything we can complain about. What strikes you right away is the appearance of this handpiece, which features a smooth, virtually seamless skin that is very easy to clean compared to the ribbed cladding of most of its brethren.

From a power perspective, it maintains KaVo's reputation of producing highspeed air-driven handpieces with excellent torque, almost as good as that of electric models. And it accomplishes this feat with a head that is smaller than its predecessor, although it is still larger than those handpieces designed for pediatric applications. And one evaluator found the push-button chuck to be difficult to push when changing burs.

Its weight is moderate for a high torque handpiece, with one evaluator stating that this could be a factor in long procedures. Nevertheless, along with a streamlined body and an improved angle, you should be able to access hard-to-reach areas with more ease. The fiber optics (called cellular optics by KaVo) affords great visibility, while the four-port water spray cools the working area and flushes debris effectively, yet with far less splatter. With Cellular Optics, individual glass fibers are heat-fused into a single glass rod without glue, which typically breaks down over time with conventional fiber optics.

If there is a weakness with this handpiece, it would be that it is difficult to validate the claim to be the "quietest KAVO high-speed ever"—our readings show it to be in a virtual tie with the 647. Nevertheless, it is quieter than the other handpieces we tested. On the other hand, it is the most expensive product in this group.

The **Mira LUX 3 635B** is a miniature head handpiece that almost performs up to the level of its full-size siblings. It has plenty of torque, runs very smoothly, has a very effective water spray (although the one-port is not as efficient as the multi-port sprays), and the fiber optics are terrific, but can cause slight shadowing. It's also somewhat noisier than the full-size models.

The **Super-Torque LUX 3 647B** continues to play second fiddle in the KaVo hierarchy, but it actually is in a deadheat with the 6000B. This relates to the fact that

it gives you virtually the same performance as its more glamorous sibling for over \$250 less. It has plenty of torque, runs very smoothly, has a very effective water spray, and delivers almost shadowless light through the Cellular Optics. With the three-port water spray, the operative area is kept reasonably clean and lubricated for efficient bur usage. It also has an integral, anti-retraction valve for both air and water, which protects against internal contamination and presumably adds to the life of the handpiece. Unfortunately, this handpiece has a rather large head size, which can create access problems if the patient has a limited opening. And compared to the sleek, smooth-skinned 6000B, the ribbed cladding of the 647 appears dated.

The **Midwest Stylus** shares a strange profile with the XGT with a bulbous backend. It definitely "feels" different than the others, since most of its weight is away from the head. It also takes awhile to get used to its shape. Noise level was measured slightly higher than the full-size KaVo models, while its luminance was not quite as high. But torque is good, its four-port water spray cools and cleans the operative area effectively, and its head size is the smallest, along with the XGT, of all the full-size products. It is also available in a no-lube version.

The **SF 8502** has good torque, relatively quiet operation, minimal vibration, effective swivel, and excellent cooling with its five-port water spray (the most ports of any handpiece we have tested). In addition, it has the advantage of being lubrication-free and is, by far, the lightest in this category, weighing less than the half as much as the other models. However, we were not able to "feel" any increase in torque or concentricity nor reduction in vibration as claimed by the manufacturer. Its luminance was also on the low end of the continuum.

As mentioned in the Stylus commentary, the **Midwest XGT** is the original strange looking handpiece in this group. Noise level was measured at the highest level of the regular handpieces, but torque is good. Its head is almost as small as a pediatric handpiece and it is quite lightweight, but its one-port water spray lags behind most of the others in this category.

The **Midwest Quiet-Air L** is the classic handpiece that takes you back to yesteryear, but is still performing admirably. It still derives its fiber optics (the strongest

in this category) through a box situated at the base of the chair, but its push and twist coupler allows it to be disconnected from the tubing without having to unscrew it. The chuck is also unique, with its lever-like mechanism presumably providing very secure bur retention. However, for such a “mature” handpiece, the price is rather steep, considering its 1-port water spray and lack of other refinements found on more contemporary instruments.

## SLOWSPEED

**INTRAFlex LUX 2** follows in the footsteps of its high-speed siblings by offering tremendous precision in a slowspeed handpiece. Long a stepchild to its more glamorous highspeed brethren, the INTRAFlex will definitely make you realize that slowspeed handpieces can also perform at high levels. One main difference between this system and others is that the INTRAFlex has its motor integrated into the shaft. This gives you a slowspeed handpiece that looks more like a high-speed, but due to this smaller, integrated motor, you give up some torque. It also will not operate in reverse, although there is a special Multi-Flex coupler (459AN), which lets you operate in reverse as well as forward. Regardless, this system will still do everything else a slowspeed needs to do. It gives you what appears to be a bewildering array of choices.

If you are looking for an intermediate speed handpiece that really does not fit the description of a slowspeed since it operates best at higher speeds, choose the 2325LN. Intermediate speed handpieces have been used in Europe for quite some time, but their attributes have not been appreciated by North American clinicians. In use, it actually “feels” more like a highspeed and it is only available in FG. The 2320LN is a terrific handpiece for duties such as finishing margins with more tactile sense than you get using a high-speed. But it is too fast for tasks such as caries removal and polishing. If you want to replace your basic slowspeed but would like fiber optics and water spray, buy the 2307LN combined with the 67LH head. This combination will only go up to 6,500 rpm, but higher torque comes with the lower speeds. Even the higher speed 68LH works well, but may be too fast for some polishing tasks.

While the INTRAFlex is fiber optic, many polishers are large and will block the light from illuminating the tooth. At times, the light actually is distracting with some types of instruments, such as finishing discs. You would have to buy a non-lighted head to overcome this problem.

**K1** gives you the basics, if high-tech options do not appeal to you. It's a good solid handpiece that performs admirably. With a separate motor and shaft, it looks and feels more like what most North American dentists have used for years. It provides excellent torque, is very quiet, has the shortest length, and can operate in reverse. Choose the 20K combined with the 67G head. The 29K is really limited to the hygiene room.

**Midwest Rhino XP** is the handpiece you would buy from Dentsply Professional if you wanted one that is smaller and less cumbersome than the Shorty and the lightest in weight in this category. It has very good torque and balance, but it is slightly noisier and somewhat longer than the K1 and only comes in one speed.

**Midwest Shorty** is a classic. While it will not dazzle you with high tech gizmos, it will give you reliable performance over many years. Available in single or two speeds. Lubricating the motor, however, is fairly labor-intensive, more than just inserting the lubricant can tip into the handpiece and pushing the button. If this lubrication is not done properly, the Shorty can definitely misfire. It is also the noisiest by far in this group.

## ELECTRIC

### HIGHSPEED/SLOWSPEED

The **ELECTROtorque plus** continues to improve by offering its brushless motor (the only one in the section) in a shorter version. While this is not a quantum leap, it is definitely a step in the right direction. It has most of the positive features of its older sibling, but offers some additional features that make it an even better product. It has more torque, is quieter, exhibits less vibration, and has a more linear ramp up in speed (much smoother) rather than the turbo-like thrust of the original. You can adjust the water spray right on the handpiece and the control box can be programmed with your preferences. The LPA highspeed attachment, whose official name is the **GENTLEpower LUX**, has a clean, texturized skin and the head angle is designed for improved access.

However, the stainless steel skins of the motor and attachment do not match, which is a curious esthetic faux pas. And the luminance does not match the level of its air-powered cousins. It is also the most expensive handpiece in this category.

The **SiroTorque L**, in combination with the SL motor and the TI Classic handpieces, comes as close as possible to melding the power and control of an electric with the smaller size, lighter weight, and seamless skin of an air-driven product. There is also a version that features the EL 1 motor, which is a more conventional design (motor remains exposed and it presumably accepts all e-type attachments), but we only evaluated the SL motor.

In addition, there is an adapter to change the SL motor into an EL configuration. This adapter will also allow the SL motor to accept e-type attachments. We tested the handpiece with the adapter and attachments from KaVo, Midwest, and NSK. All three performed admirably, although using the adapter and attachments causes the overall length and weight of the handpiece to increase substantially. If you use this adapter, make sure it snaps firmly and securely into place, which did not happen when we first installed it. After some trial-and-error, we finally seated it on the motor completely.

Nevertheless, the classic handpieces designed for the SL motor largely overcome two of the main complaints against electrics, namely size and weight. While neither of these parameters comes close to matching an air-driven highspeed, they do allow it to be the lightest and shortest electric handpiece we have tested. But the list of features doesn't stop there. To our knowledge, it is the only handpiece where you can turn the fiber optic illumination off and on via a simple switch on the control panel.

However, three evaluation units had light bulbs burn out (in one unit, the bulb had to be replaced twice). The correction for this problem is to presumably lower the voltage from 3.3 to 3.0, but if the bulbs cannot operate above the minimum voltage, then why even have this adjustment built into the control panel? Furthermore, our tests showed a much lower illumination level at 3.0v compared to 3.3v, although this lower level should still be acceptable for clinical use.

You can also regulate the water spray using the rotating knob at the base of the handpiece, although there is no marking for the endpoints. This latter omission eliminates your being able to preset the amount of water flow you prefer. On the other hand, you can choose between different spray rings, although the basic 3-port design will most likely be favored by the vast majority of users. This design produces an excellent aerosol to minimize debris clogging the rotary instrument and to keep the preparation as clean as possible. One evaluator, however, using the 3-port design, was not able to create a true aerosol mist—he reported more water streaming than misting.

The seamless feature gives the unit the same type of sleek appearance as an air-powered version. The titanium composition and spiral crease add to its futuristic design. The absence of joints also permits a more hygienic operation (assuming you remove or order it without the add-on sleeve provided on U.S. versions), since your contaminated gloved hands only touch the handpiece, which is autoclavable, not the motor, which is not.

Since the heads are seamless with the sheaths of the handpieces, there is no confusion in matching a head with an attachment, although this design does somewhat limit your flexibility. For example, the slowspeed handpieces only accept latch-type burs—you're out of luck if you want to use a friction grip bur at these low speeds. And, while the handpieces are ergonomically well balanced, their heads are about the same size as other electrics, which mean they are longer than comparable air-driven instruments. This longer length could interfere with access to posterior areas in those patients with limited opening. Nevertheless, each handpiece is color-coded and has the gear ratio engraved for easy reference. And there are two Profin heads, one whose stroke length is 0.4mm and the other with 1.1mm stroke length, which is very similar to the original product from Dentatus.

The brush-type motor, however, despite its long track record, has been superseded by newer, brushless versions, which tend to be quieter (it is the noisiest among the three products we tested) and eliminate having to replace the brushes when they wear out. At least two evaluators had installation issues, some of which are due to the basic design. For example, the connection from the electrical outlet plug to the transformer and the control unit is continuous. You cannot detach the segments of the cords to make the installation easier and cleaner.

There were also other maintenance issues. On one unit, the control display read 20 instead of 40. Then this unit totally stopped working and had to be replaced. One evaluator also thought the torque was not quite as good as expected.

The removal of the handpieces is not very easy either. There is not much surface area to grip at the motor end while pulling them off. Additionally, the swiveling "water volume adjustment" at the end of the motor always seems to move when removing or installing an angle; thus requiring further adjustment. And, of course, these handpieces require lubrication, which is a step backward if you have been using one of the new, lube-free products.



The **Midwest eStylus** is probably the easiest of the electrics to use, since your options are relatively limited. You have three attachments from which to choose and by merely pushing the color-coded button on the control panel, you are ready to start cutting after adjusting the speed to your preference. You don't need to perform any high level mathematical calculations either—the speed is displayed in full digits. The detachable control panel is also an interesting and useful feature, communicating with the base unit via a RF connection. In addition, being able to remove the smooth, satin-finished stainless steel sheath over the motor for autoclaving keeps this product at the forefront of asepsis. The motor has an integral swivel,

while the handpieces have matching color and finish, but add dimpling for better slip-resistance. The light intensity was moderate, but the noise level was very low.

However, the brush-type electric motor is a generation behind. It does not have several useful features found on other products such as water control on the motor and being able to turn off the fiber optics on the control panel. In addition, the highspeed and motor are on the heavy end of the continuum, even for electrics, when it comes to weight.

## OTHER PRODUCTS IN THIS CATEGORY

### **Air Highspeed**

**Bora S36**  
Bien-Air

**Bora S36L**  
Bien-Air

**430 SWL StarBright**  
StarDental

**NL-85**  
NSK/Brasseler USA

**Optima Plus**  
Bien-Air

**SF 7807**  
MTC

**SF 7907**  
MTC

**SF 8501**  
MTC

**Synea TA-96Lw**  
W&H/A-dec

**Synea TA-98Lw**  
W&H/A-dec

**Ti-Max NL-95**  
NSK/Brasseler USA

**330E**  
Lares

**55.7 Turbo +**  
Lares

**757 Workhorse**  
Lares

### **Air Slowspeed**

**Micro DSL Dual**  
Micro Motors

**Micro PHP**  
Micro Motors

**RDH**  
Dentsply Professional

**Synea Lowspeed**  
W&H/A-dec

**Trend Lowspeed**  
W&H/A-dec

### **Electric Highspeed/ Slowspeed**

**CA 14 43**  
Bien-Air

**ELECTROtorque/  
INTRAmatic**  
KaVo

**Optima US**  
Bien-Air

**Ti-Max EL400**  
NSK/Brasseler USA

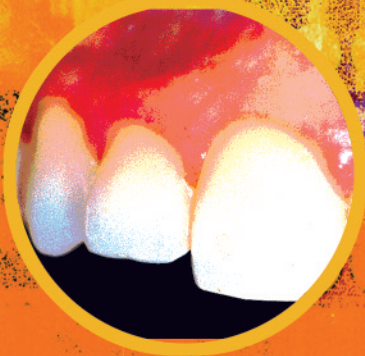
### **Electric Slowspeed Only**

**Endo Pro America**  
Medidenta

**Rotary Master**  
J.Morita

**Titan Electric**  
Star





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